

## 10-2

**Skills Practice****Logarithms and Logarithmic Functions****Write each equation in logarithmic form.**

1.  $2^3 = 8$

2.  $3^2 = 9$

3.  $8^{-2} = \frac{1}{64}$

4.  $\left(\frac{1}{3}\right)^2 = \frac{1}{9}$

**Write each equation in exponential form.**

5.  $\log_3 243 = 5$

6.  $\log_4 64 = 3$

7.  $\log_9 3 = \frac{1}{2}$

8.  $\log_5 \frac{1}{25} = -2$

**Evaluate each expression.**

9.  $\log_5 25$

10.  $\log_9 3$

11.  $\log_{10} 1000$

12.  $\log_{125} 5$

13.  $\log_4 \frac{1}{64}$

14.  $\log_5 \frac{1}{625}$

15.  $\log_8 8^3$

16.  $\log_{27} \frac{1}{3}$

**Solve each equation or inequality. Check your solutions.**

17.  $\log_3 x = 5$

18.  $\log_2 x = 3$

~~19.  $\log_4 y < 0$~~

20.  $\log_{\frac{1}{4}} x = 3$

~~21.  $\log_2 n > -2$~~

22.  $\log_b 3 = \frac{1}{2}$

23.  $\log_6 (4x + 12) = 2$

~~24.  $\log_2 (4x - 4) > 5$~~

25.  $\log_3 (x + 2) = \log_3 (3x)$

~~26.  $\log_6 (3y - 5) \geq \log_6 (2y + 3)$~~

10-2

**Practice****Logarithms and Logarithmic Functions****Write each equation in logarithmic form.**

1.  $5^3 = 125$

2.  $7^0 = 1$

3.  $3^4 = 81$

4.  $3^{-4} = \frac{1}{81}$

5.  $\left(\frac{1}{4}\right)^3 = \frac{1}{64}$

6.  $7776^{\frac{1}{5}} = 6$

**Write each equation in exponential form.**

7.  $\log_6 216 = 3$

8.  $\log_2 64 = 6$

9.  $\log_3 \frac{1}{81} = -4$

10.  $\log_{10} 0.00001 = -5$

11.  $\log_{25} 5 = \frac{1}{2}$

12.  $\log_{32} 8 = \frac{3}{5}$

**Evaluate each expression.**

13.  $\log_3 81$

14.  $\log_{10} 0.0001$

15.  $\log_2 \frac{1}{16}$

16.  $\log_{\frac{1}{3}} 27$

17.  $\log_9 1$

18.  $\log_8 4$

19.  $\log_7 \frac{1}{49}$

20.  $\log_6 6^4$

21.  $\log_3 \frac{1}{3}$

22.  $\log_4 \frac{1}{256}$

23.  $\log_9 9^{(n+1)}$

24.  $2^{\log_2 32}$

**Solve each equation or inequality. Check your solutions.**

25.  $\log_{10} n = -3$

~~26.~~  $\log_4 x > 3$

27.  $\log_4 x = \frac{3}{2}$

28.  $\log_{\frac{1}{5}} x = -3$

~~29.~~  $\log_7 q < 0$

~~30.~~  $\log_6 (2y + 8) \geq 2$

31.  $\log_y 16 = -4$

32.  $\log_n \frac{1}{8} = -3$

33.  $\log_b 1024 = 5$

~~34.~~  $\log_8 (3x + 7) < \log_8 (7x + 4)$  35.  $\log_7 (8x + 20) = \log_7 (x + 6)$  36.  $\log_3 (x^2 - 2) = \log_3 x$

~~37.~~ **SOUND** Sounds that reach levels of 130 decibels or more are painful to humans. What is the relative intensity of 130 decibels?~~38.~~ **INVESTING** Maria invests \$1000 in a savings account that pays 8% interest compounded annually. The value of the account  $A$  at the end of five years can be determined from the equation  $\log A = \log[1000(1 + 0.08)^5]$ . Find the value of  $A$  to the nearest dollar.